

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A hub unit for wheel comprising:

an outer ring having two bearing tracks on its inner circumferential surface;

a hub having a wheel mount flange on the outer end side and an end portion on the axially vehicle center side, said hub having, one of integrally ~~or~~ and as a separate part on its outer circumference, a first bearing track corresponding to the axially vehicle outer end side bearing track of said outer ring;

an inner ring element fitted on said end portion side of said hub, said inner ring element having on its outer circumference a second bearing track opposed to the axially vehicle center side bearing track of said outer ring and being fixed on said end portion by plastically deforming said end portion of said hub radially outwardly by caulking, said inner ring element being formed with a chamfered portion between an inner circumferential surface and a vehicle center side end face; and

rolling members provided between the two bearing tracks of said outer ring and said first and second bearing tracks,

wherein said end portion of the hub is formed integrally with a first smaller diameter circumferential portion continuously to a portion of the second bearing track having a circumferential diameter smaller than that of the second bearing track and said inner ring element being fitted on the first smaller diameter circumferential portion; and

in a state before plastically deformed by caulking, said end portion of the hub being further formed with a second smaller diameter peripheral portion that is continuous to the first smaller diameter circumferential portion and has a smaller diameter than that of the first smaller diameter circumferential portion, and the start point of the second smaller diameter circumferential portion is located at a position whose distance from a boundary between the first bearing track and the second bearing track is smaller than the width of the inner ring element and larger than the length of difference between the width of the inner ring element and the length from the start point of the inner surface of the chamfered portion to said vehicle center side end face of the inner ring element
~~the outer diameter of a portion to be plastically deformed of said end portion is made smaller than the diameter of the portion of the inner ring element that is fitted on the hub, the start point of said small diameter portion is arranged to be situated between the start point of a chamfered portion on the inner circumferential surface of the inner ring element and the vehicle center side end face of the inner ring element, and said end portion is plastically deformed radially outwardly to fasten and fix said inner ring element.~~

2. (Currently Amended) A hub unit for wheel comprising:

an outer ring having two bearing tracks on its inner circumferential surface;

a hub having a wheel mount flange on the outer end side and an end portion on the axially vehicle center side, said hub having, ~~as a separate part or~~ integrally on its outer circumference, a first bearing track corresponding to the axially vehicle outer end side bearing track of said outer ring;

an inner ring element fitted on said end portion side of said hub, said inner ring element having on its outer circumference a second bearing track opposed to the axially vehicle center side bearing track of said outer ring and being fixed on said end portion by plastically deforming said end portion of said hub radially outwardly by caulking, said inner ring element being formed with a chamfered portion between an inner circumferential surface and a vehicle center side end face; and

rolling members provided between the two bearing tracks of said outer ring and said first and second bearing tracks,

wherein said end portion of the hub is formed integrally with a first smaller diameter circumferential portion continuously to a portion of the second bearing track through a step portion therebetween, a circumferential diameter of the first smaller diameter circumferential portion is smaller than that of the second bearing track and said inner ring element being fitted on the first smaller diameter circumferential portion;

in a state before plastically deformed by caulking, said end portion of the hub being further formed with a second smaller diameter peripheral portion that is continuous to the first smaller diameter circumferential portion and has a smaller diameter than that of the first smaller diameter circumferential portion, and

the start point of the second smaller diameter circumferential portion is located at a position whose distance from said step portion of the hub is smaller than the width of the inner ring element and larger than the length of difference between the width of the inner ring element and the length from the start point of the inner surface of the chamfered portion to said vehicle center side end face of the inner ring element ~~the outer diameter of a portion to be plastically deformed of said end portion is made smaller than the diameter of the portion of the inner ring element that is fitted on the hub, the start point of said small diameter portion is arranged to be situated between the start point of a chamfered portion on the inner circumferential surface of the inner ring element and the vehicle center side end face of the inner ring element and said end portion is plastically deformed radially outwardly to fasten and fix said inner ring element.~~

3. (Currently Amended) A hub unit for wheel according to claim 1, wherein said second smaller diameter peripheral ~~portion to be plastically deformed of said inner ring element~~ has a radius between 0.2 mm – 1.00 mm smaller than that of said portion of said inner ring element that is fitted on the first smaller diameter peripheral portion of the hub.

4. (New) A hub unit for wheel according to claim 2, wherein said second smaller diameter peripheral portion to be plastically deformed of inner ring element has a radius between 0.2 mm - 1.00 mm smaller than that of said portion of said inner ring element that is fitted on the first smaller diameter peripheral portion of the hub.

5. (New) A hub unit for wheel according to claim 1, wherein said second smaller diameter peripheral portion of said hub has a hardness HRC 15- 28.

6. (New) A hub unit for wheel according to claim 2, wherein said second smaller diameter peripheral portion of said hub has a hardness HRC 15- 28.

7. (New) A hub unit for wheel comprising:
an outer ring having two bearing tracks on its inner circumferential surface;
a hub having a wheel mount flange on the outer end side and an end portion on the axially vehicle center side, said hub having, as a separate part or integrally on its outer circumference, a first bearing track corresponding to the axially vehicle outer end side bearing track of said outer ring;
an inner ring element fitted on said end portion side of said hub, said inner ring element having on its outer circumference a second bearing track opposed to the axially vehicle center side bearing track of said outer ring and being fixed on said

end portion by plastically deforming said end portion of said hub radially outwardly by caulking; and

rolling members provided between the two bearing tracks of said outer ring and said first and second bearing tracks,

wherein a continuous circumferential groove is provided on the inner circumferential surface of said inner ring element at an axially more vehicle center side than the second bearing track; and

a portion of the hub end portion on which the inner ring element is fitted, is expanded inside the continuous circumferential groove of said inner ring element by material forming the hub end portion having been flown and expanding therein.

8. (New) A hub unit for wheel according to claim 7, wherein said expanded portion is protruded in the continuous circumferential groove of the hub end portion.

9. (New) A hub unit for wheel according to claim 7, wherein the continuous circumferential groove of the hub end portion has a depth in the range of about 0.5 to 3 mm and a width in the axial direction in the range of about 1.0 to 8.0 mm.

10. (New) A hub unit for wheel according to claim 8, wherein the continuous circumferential groove of the hub end portion has a depth in the range of about 0.5 to 3 mm and a width in the axial direction in the range of about 1.0 to 8.0 mm.

11. (New) A hub unit for wheel according to claim 7, wherein the continuous circumferential groove of the hub end portion has a depth in the range of about 0.5 to 3 mm and a width in the axial direction in the range of about 2.0 to 6.0 mm.

12. (New) A hub unit for wheel according to claim 8, wherein the continuous circumferential groove of the hub end portion has a depth in the range of about 0.5 to 3 mm and a width in the axial direction in the range of about 2.0 to 6.0 mm.

13. (New) A hub unit for wheel according to claim 7, wherein the continuous circumferential groove of the hub end portion has an asymmetric, substantially triangular cross section, a vehicle outer side oblique surface of the triangular cross section being steeper than a vehicle inner side oblique surface of the same cross section.

14. (New) A hub unit for wheel according to claim 8, wherein the continuous circumferential groove of the hub end portion has an asymmetric, substantially triangular cross section, a vehicle outer side oblique surface of the triangular cross section being steeper than a vehicle inner side oblique surface of the same cross section.